



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,519	02/12/2004	Jun Miura	TESD.0032	4155
7590	12/28/2005		EXAMINER	
			HOANG, ANN THI	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/776,519	MIURA, JUN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ann T. Hoang	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 12 February 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-6 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-6 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 12 February 2004 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2/12/04</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### *Drawings*

1. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 55. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

3. The disclosure is objected to because of the following informalities: On page 5, line 26; page 7, lines 15 and 25; and page 8, lines 2 and 18, the claims should not be referred to, as the disclosure of the invention should not rely on the claims. On page 14, line 10, the first Zener diode should be referenced with the number 4 in order to be consistent with the drawings. On page 19, line 26-27, "DV operating voltage" should be changed to "DC operating voltage." Lastly, it is recommended that "compacter" be changed to "more compact" everywhere it occurs throughout the specification.

Appropriate correction is required.

***Claim Objections***

4. Claim 1 is objected to because the end of paragraph 2 of the claim is worded in a way that makes it unclear. It is recommended that "a first switching element controlled to be turned on and off being connected between the one end and the other end" be changed to "a first switching element controlled to be turned on and off being connected between the one end of the first circuit and the other end of the first circuit."

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baek (US 5,073,837) in view of Crompton (US 5,708,574).

Regarding claim 1, Baek discloses a power supply detection circuit provided in an electric device comprising therein a power supply circuit (18); an operating voltage output terminal (10) outputting an operating voltage input from the power supply circuit (18); and a control microcomputer (22), the power supply detection circuit comprising:

a first circuit provided between the operating voltage output terminal (10) and a power fail terminal (12) for monitoring the operating voltage of the control microcomputer (22), having one end connected to the operating voltage output terminal (10) and another end connected to the power fail terminal (12) of the control microcomputer (22), a first switching element (Q2, Q3) controlled to be turned on and off being connected between the one end (10) and the another end (12); and

a third circuit comprising: a second voltage detection element (ZD2) inputting the voltage output from the operating voltage output terminal (10), and detecting whether the input voltage is a proper voltage or an overvoltage or a reduced voltage; and a third switching element (Q4) controlled to be turned on and off in accordance with detection of the voltage by the second voltage detection element (ZD2), and controlling the first switching element (Q2, Q3) to be turned on and off, wherein

if a proper operating voltage is output from the operating voltage output terminal (10), then the second voltage detection element (ZD2) turns on the third switching element (Q4) to thereby turn on the first switching element (Q2, Q3), whereby the first switching element (Q2, Q3) inputs a voltage signal based on the proper operating voltage to the power fail terminal (12) of the control microcomputer (22),

if the overvoltage is output from the operating voltage output terminal (10), then

Art Unit: 2836

the second voltage detection element (ZD2) turns on the third switching element (Q4) to thereby turn on the first switching element (Q2, Q3), and

if the reduced voltage is output from the operating voltage output terminal (10), then the second voltage detection element (ZD2) fails to turn on the third switching element (Q4) to thereby fail to turn on the first switching element (Q2, Q3), whereby the reduced voltage is prevented from being input to the power fail terminal (12).

If the voltage at operating voltage output terminal (10) is greater than or equal to a predetermined voltage, second voltage detection element (ZD2) senses it as an overvoltage or proper voltage and passes the signal to drive the base of third switching element (Q4), which in turn drives first switching element (Q2, Q3) to be in an ON state so that (Q2, Q3), disclosed as a Darlington pair switching element, may form a signal path from operating voltage output terminal (10) to power fail terminal (12). If the voltage at operating voltage output terminal (10) is less than a predetermined voltage, second voltage detection element (ZD2) acts as an open circuit and cannot turn on third switching element (Q4). With (Q4) in an OFF stage, there is no drive signal for (Q2, Q3) to turn on and (Q2, Q3) fails to establish a signal path between (10) and (12). The power supply detection circuit of Baek serves to open the connection between (10) and (12) upon the occurrence of an undervoltage so that the undervoltage signal is not sent from operating voltage output terminal (10) to power fail terminal (12) when a power fail in the form of an undervoltage is present. Power fail terminal (12) is connected to element (22), which is disclosed as a power source circuit containing a constant voltage circuit and a microcomputer. See Fig. 2; column 1, lines 7-9; column 2, lines 31-37 and

Art Unit: 2836

66-68; column 3, lines 1-13; and column 4, lines 13-33. Baek does not disclose a second circuit for providing overvoltage detection.

However, Crompton discloses a second circuit in comprising: a first voltage detection element (160) inputting a voltage output from an operating voltage output terminal (170) of a power supply, and detecting whether the input voltage is an overvoltage; and a second switching element (175) being connected between operating voltage output terminal (170) and a ground (180), the second switching element (175) is connected between operating voltage output terminal (170) and the ground (180) so as to be controlled to be turned on and off in accordance with detection of the overvoltage by the first voltage detection element (160), wherein

if the overvoltage is output from the operating voltage output terminal (170), the first voltage detection element (160) detects the overvoltage to thereby turn on the second switching element (175), whereby the operating voltage output terminal (170) of the power supply is set at a ground potential.

First voltage detection element (160) is connected to operating voltage output terminal (170) of a power supply so that, if the voltage at (170) exceeds a predetermined value, the voltage will drop across (160) to turn ON second switching element (175) at its base, which pulls operating voltage output terminal (170) to ground (180) as a safety measure. If there is no overvoltage detected at (170), first voltage detection element (160) acts as an open circuit so that second switching element (175) is OFF and does not pull operating voltage output terminal (170) to ground (180). First voltage detection element (160) and second switching element (175) of Crompton are

overvoltage protection devices for operating voltage output terminal (170) of the power supply. See Fig. 3 and column 2, lines 4-12 and 27-38.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the power supply detection circuit of Baek and overvoltage protection circuit of Crompton and use the overvoltage protection circuit of Crompton to protect the power fail terminal of Baek in order to provide a single protection circuit which offers proper voltage detection and undervoltage detection, as well as overvoltage detection. Such an arrangement would require the second switching element of Crompton to be connected between the power fail terminal of Baek and ground so that, upon the detection of an overvoltage at the operating voltage output terminal by the first voltage detection element, the power fail terminal would be pulled to ground as a safety measure and in order to prevent the overvoltage signal from traveling from the operating voltage output terminal to the power fail terminal. Additionally, the second switching element could only be ON if the first switching element was ON, as this would mean that the voltage at the operating voltage output terminal was greater than the undervoltage threshold value. In the case of undervoltage detection, the first switching element would be OFF and the second switching element would also necessarily be OFF.

Regarding claim 2, Baek discloses that the first switching element (Q2, Q3) is a first transistor comprising a PNP transistor (Q2), the third switching element (Q4) is a third transistor comprising an NPN transistor, the second voltage detection element (ZD2) is a second Zener diode having a reverse withstand voltage that would

necessarily be slightly lower than the proper operating voltage in order to detect and block undervoltages including those barely under the proper operating voltage, the first transistor (Q2) is connected so that an emitter terminal is on one end side (10) of a first circuit and so that a collector terminal is on another end side (12) of the first circuit, and a cathode of the second Zener diode (ZD2) is connected to the operating voltage output terminal (10), a base terminal of the third transistor (Q4) is connected to an anode of the second Zener diode (ZD2) through a resistor (R4), a collector terminal of the third transistor (Q4) is connected to a base terminal of the first transistor (Q2) through a resistor (R8) and the other transistor (Q3) of the Darlington pair, and an emitter terminal of the third transistor (Q4) is connected to the ground through diodes (ZD3, D3). See Fig. 2.

Crompton discloses that the second switching element (175) is a second transistor comprising an NPN transistor, the first voltage detection element (160) is a first Zener diode having a reverse withstand voltage that would necessarily be slightly higher than the proper operating voltage in order to detect and pass overvoltages including those barely over the proper operating voltage, and a cathode of the first Zener diode (160) is connected to the operating voltage output terminal (170), and emitter terminal of the second transistor (175) is connected to the ground (180), and a base terminal of the second transistor (175) is connected to an anode of the first Zener diode (160). See Fig. 3. In order for second transistor (175) to pull the power fail terminal to ground in the event of an overvoltage, as mentioned above, the collector terminal of second transistor (175) would necessarily be connected to the power fail

terminal so that the current could flow from the power fail terminal to ground during the ON state of second transistor (175).

Regarding claims 3 and 5, Baek discloses a constant voltage maintaining circuit (22), provided on the another end of the first circuit connected to the power fail terminal (12), for setting the voltage input to the power fail terminal to be equal to or lower than a constant voltage. See Fig. 2 and column 2, lines 56-62.

7. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baek (US 5,073,837) in view of Crompton (US 5,708,574), as applied to claims 3 and 5 above, in further view of the acknowledged prior art.

Regarding both claims 4 and 6, Baek discloses a constant voltage maintaining circuit (22) but not the details of the circuit. However, the acknowledged prior art of Applicant's disclosure discloses a constant voltage maintaining circuit comprising a third Zener diode (53) having a cathode connected to a power fail terminal (56a) and an anode connected to the ground, wherein if a voltage exceeding the reverse withstand voltage of third Zener diode (53) is applied to the third Zener diode (53) in a reverse direction, the third Zener diode (53), a resistance (57) connected between an operating voltage output terminal (58) and the power fail terminal (56a), and a resistance (54) connected to the third Zener diode (53) in parallel maintain the power fail terminal (56a) of the first circuit at the reverse withstand voltage of third Zener diode (53).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the constant voltage maintaining circuit of the acknowledged prior art as the constant voltage maintaining circuit of Baek in order to provide means of

preventing the power fail terminal from rising above a predetermined voltage through cheap electrical components, and in order to provide further overvoltage protection to the power fail terminal in addition to that provided by the second circuit of Crompton. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the third Zener diode to have a reverse withstand voltage slightly higher than the voltage corresponding to the proper operating voltage of the power fail terminal in order to provide protection against overvoltages, not to exclude voltages barely greater than the proper operating voltage, as those may damage the load.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Morris et al. (US 3,754,182) discloses a low voltage detection circuit comprising a Zener diode which, upon sensing a low voltage at the output terminal of a power supply, causes an NPN transistor to be in an OFF state so that a PNP transistor laying between the output terminal of the power supply and a load is also in an OFF state so as to impede the passing of the power signal. If the Zener diode detects a proper operating voltage at the output terminal of the power supply, it causes the NPN transistor to turn ON to drive the PNP transistor to an ON state, and the power signal is passed from the output terminal of the power supply across the PNP transistor to the load.

Ozawa et al. (JP 01-198214) discloses a detector for low voltage comprising a Zener diode which, upon sensing a low voltage at one terminal, causes an NPN transistor to be in an OFF state so that a PNP transistor laying between the one

terminal and another terminal is also in an OFF state so as to impede the passing of the signal from one terminal to the other. If the Zener diode detects a proper operating voltage at the one terminal, it causes the NPN transistor to turn ON to drive the PNP transistor to an ON state, and the signal is consequently passed from one terminal to the other.

Forte (US 3,597,655) discloses a means to actuate a crowbar circuit, which shorts an output terminal to ground in response to an overvoltage.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann T. Hoang, whose telephone number is 571-272-2724. The examiner can normally be reached Monday through Friday, 8:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached at 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



PHUONG T. VU  
PRIMARY EXAMINER